

Chapter 53

The Case for Serious Games in Education

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ABSTRACT

The chapter sets the scope, rationale and purpose of the book. It then covers a number of related topics, principally a review of learning theories and considers Bloom's well known learning taxonomy, and at which levels games of the mixed reality genre can be associated. The impact of games and simulations in learning is backed up by evidence from a survey of opinions as to which types of learning raise achievement levels the most. It also introduces the concepts of Experiential Learning (EL), Problem Based Learning (PBL) and Simulation Based Training (SBT) and then considers recent developments in education such as digital games, e-learning, distance and blended learning. It concludes with a review of earlier assessments of the value of games and an introduction to the suggested elements of good design in mixed reality games.

INTRODUCTION AND INTENDED READERSHIP¹

This chapter sets out the scope, rationale and purpose of the book. It covers a number of related topics, principally a review of learning theories. It also introduces the concepts of Experiential Learning (EL), Problem Based Learning (PBL) and Simulation Based Training (SBT) and then considers recent developments in education such as digital games, distance learning, blended learning and e-learning. It concludes with a review of earlier evaluations of games and an introduction to the suggested elements of good design in mixed reality games.

When teaching your dog to fetch a stick it is no use giving him a certificate at the end of the year. It could be added that giving him a book or a twenty minute PowerPoint lesson would be equally ineffective, though that analogy may be a bit unfair to corporate trainees or even students. However it can be

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said and hopefully demonstrated in this book that serious games, by placing participants into real life scenarios and providing immediate and continuous feedback on their decisions, can be more effective than traditional methods of teaching.

This book should be of interest to anyone concerned with training in the areas of business strategy and the often less-than-successful process of setting up a new business venture. It should also provide insights and ideas on education and training in the huge arena of project management which can include civil engineering, construction or the implementation of manufacturing projects and operations. While the book places its emphasis on Higher Education (HE) most of the content and examples could be of equal value at all levels from 'sixteen plus' if adapted accordingly. In particular, those who may find benefit from it are:

- Course Leaders and Coordinators in formal education.
- Tutors and instructors tasked with problem based initiatives.
- Corporations which conduct employee training programmes.
- Independent trainers for either academic institutions or businesses.
- Designers of serious games and simulations.

The adoption of such methods varies greatly from one institution to another and even by country. Hallinger and Bridges (2016: p 256) note that their analysis of school leadership preparation conducted since the 1990s has highlighted the use of Problem Based Learning (PBL) in the United States, Australia, Europe and Asia while being surprised to find not even one "systematic review of research" on the use of PBL in educational leadership. During their recent investigations within Faculties of Engineering and related subjects the present Authors have found considerable variations in the adoption of experiential learning in the five U.K. Universities in which their Team Based Mixed Reality (TBMR) games research was conducted. While teamwork in classes was seen to be quite prevalent, the actual use of serious games as such was less in evidence. Some of the limitations and barriers to the introduction of the proposed methods are covered in the Conclusion, Section 2.

According to an early educational progressivist John Dewey, "The chief business of traditional education is to transmit to a next generation those skills, facts, and standards of moral and social conduct that adults consider to be necessary for the next generation's material and social success". As beneficiaries of this scheme, which Dewey described as being "imposed from above and from outside", the students are "expected to docilely and obediently receive and believe these fixed answers. Teachers are the instruments by which this knowledge is communicated and these standards of behavior are enforced" (Dewey, 1938).

Since that period a raft of teaching and learning initiatives have arisen, under the general heading of progressive education. Some of these are known variously as Experiential Learning (EL), Problem Based Learning (PBL), Project Based Learning (PjBL), Simulation Based Training (SBT) and more recently Serious Games and in particular Team Based Mixed Reality (TBMR) games.

While each of the developments will be discussed and compared (See Chapter 3) this book primarily focuses on the last of these and will provide practical illustration in support of the arguments for adopting them via a number of practical examples. The term Serious Games refers to those designed for educational purposes rather than pure entertainment, as defined by Djaouti, Alvarez and Jessel, (2011). Susi et al. (2007) suggest a definition of serious games as "those that engage the user and contribute to the achievement of professional objectives. They focus on the solving of a special task containing important elements of learning and reflect material communications". The term gamification has come into use

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